CERCLIS# LAD985170711
CASE# FY90-1364

REMOVAL ASSESSMENT - FINAL REPORT
FOR
WESTBANK ASBESTOS
MARRERO, JEFFERSON PARISH, LOUISIANA

July 30, 1996

Prepared for:

U.S. Environmental Protection Agency
Region 6
Program Management Branch
Mr. Henry Thompson, Jr.
Project Officer

Contract Number: 68-W6-0013

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CERCLIS# LAD985170711
CASE# FY90-1364

DATE: **July 30, 1996**

TO: **John Martin, TM**
EPA Region 6, Response and Prevention Branch

THRU: **Henry Thompson, Jr., PO**
EPA Region 6, Program Management Branch

THRU: **Chris Quina, STL**
Region 6, Superfund Technical Assessment and Response Team

FROM: **Troy M. Naquin**
Region 6, Superfund Technical Assessment and Response Team

SUBJ: **Removal Assessment - Final Report: Westbank Asbestos**
Marrero, Jefferson Parish, Louisiana
TDD#: S06-9601-033 (previously TDD# T06-9511-010)
PAN: 003501SFXX
LAT 29°53'58"N, LONG 90°06'45"W

I. INTRODUCTION

The Westbank Asbestos (WBA) site is located on the westbank of the Mississippi River near the City of New Orleans, Louisiana. The site includes residential and commercial properties contaminated with asbestos in the Jefferson Parish communities of Bridge City, Westwego, Marrero, Harvey, and Gretna and the Orleans Parish community of Algiers (Interim Report No. 2 - Attachment A). The source of the asbestos contamination was from the Johns-Manville plant located in Marrero, Jefferson Parish, Louisiana. The geographic coordinates near the south entrance to the former Johns-Manville plant (corner of 4th and Pine streets) resides at Latitude 29°53'58" North, Longitude 90°06'45" West, as scaled from the United States Geological Survey (USGS) New Orleans East and New Orleans West quadrangle, 7.5 minute series topographic maps. For these maps the scale is 1:24,000 and is in the North American Datum - 27 (NAD-27).

On November 11, 1995, the EPA Region 6 Response and Prevention Branch (RPB) tasked the Technical Assistance Team (TAT) contractor to conduct site assessment activities at the WBA site under Technical Direction Document (TDD) No. T06-9511-010. TAT was directed to: coordinate with state and local officials as appropriate; evaluate current site conditions; conduct an extent of contamination survey for asbestos; estimate waste volumes; generate AutoCad and/or Graphic Information System (GIS) site maps; draft approach and procedures for conducting a Human Health Risk Assessment (HHRA); evaluate mitigation options for technical viability, effectiveness, and cost; and coordinate with the EPA On-Scene Coordinator(OSC)/Task Monitor (TM) John Martin. Due to a change in the EPA technical assistance contract in early 1996, assigned tasks were continued under the Superfund Technical Assessment and Response Team (START) contract under replacement TDD No. S06-9601-033 issued on January 22, 1996. On April 4, 1996, EPA TM Martin assigned additional specific elements to the TDD which included: procure analytical services for 60 bulk samples for asbestos analysis by polarized light microscopy (PLM) and 30 soil samples for asbestos analysis by transmission electron microscopy (TEM); develop a Sampling Quality Assurance/Quality Control (QA/QC) Plan for the collection and analysis of bulk and soil samples; implement Sampling QA/QC Plan; and submit an interim report by May 7, 1996, to include analytical results of bulk and soil sampling, a site location map, and calculations of removal cost estimates. On May 20, 1996, EPA TM Martin determined that drafting an approach and procedures for conducting the HHRA would not be needed at this time and verbally stopped-work on that task. On May 28, 1996, EPA TM Martin tasked START to submit a second interim report by June 14, 1996, to include results of all tasks and information collected to date.

This current deliverable represents the final report and includes a synopsis of work activities conducted from June 14, 1996 through July 29, 1996. All work activities conducted prior to June 14, 1996 were discussed in two interim reports previously submitted to the EPA. The May 2, 1996 Removal Assessment - Interim Report No. 1 is provided as Attachment A and the June 14, 1996 Removal Assessment - Interim Report No. 2 is provided as Attachment B to this report.

II. BACKGROUND

Asbestos is a naturally occurring mineral that was utilized in a wide variety of industrial products. Asbestos represents a group of silicate minerals that readily separates into thin, strong fibers that are flexible, heat resistant, and chemically inert. Asbestos minerals are divided into two groups that are distinguished by their crystalline structures. These groups include: serpentine minerals that have a sheet or layered structure; and amphiboles that have a chain-like structure. Serpentine minerals consists of chrysotile which is the most commonly used type of asbestos and accounts for approximately 95% of asbestos used in manufacturing. Amphibole minerals consists of five types of asbestos which include: amosite, crocidolite, anthophyllite, tremolite, and actinolite. Health studies have showed that exposure to amosite and crocidolite asbestos, due to their short, rigid, fibrous nature, results in the greatest potential risk of contracting an asbestos-related disease. The WBA site consists of asbestos waste material contaminated with chrysotile and crocidolite fibers.

Background information for the WBA site was gathered from the Louisiana Department of Environmental Quality (LDEQ) and interviews conducted in the field with local residents and former employees of the Johns-Manville plant. The WBA site consists of residential and commercial properties contaminated with asbestos in the Jefferson Parish communities of Bridge City, Westwego, Marrero, Harvey, and Gretna and the Orleans Parish community of Algiers. The source of the asbestos was from a Johns-Manville plant that operated in Marrero, Jefferson Parish, Louisiana. The plant consisted of many operation and manufacturing buildings located on 56 acres of land (Interim Report No. 2 · Attachment B). The plant is bordered by the Mississippi River to the north, commercial facilities to the west, and residential communities to the south and east. The residential communities surrounding the plant in the westbank area are the focus of this investigation. The 1995 population of the westbank communities as stated in *The Source of Zip Code Demographics; 10th Edition,* includes: Westwego - 11,163; Marrero - 63,025; Harvey - 37,234; and Gretna - 57,112. The 1990 federal census lists the population of Bridge City at 8,327 and population within the area of concern in Algiers as 5,611.

Johns-Manville operated the plant in Marrero from 1929 to 1975 which produced various types of asbestos-containing products. These products included an asphalt roofing tile, several varieties of transite materials, and other asbestos-containing products. An asbestos-containing aggregate was generated as a by-product during manufacturing operations. The aggregate was pulverized in a hammer mill and mixed with a filler, usually composed of gypsum, dolomite, or calcite, to form a stable road-bed-like material. This asbestos-containing material (ACM) was then offered to local residents, free-of-charge, for construction of driveways, servitudes, walkways, and other areas. Consequently, many of these areas in the residential communities surrounding the Johns-Manville plant contain ACM waste. The ACM is visually recognizable by its light bluish-grey, cementitious texture. No records are currently available concerning the quantity of ACM and the exact time period in which the ACM was distributed to the public. The ACM waste was also disposed of by Johns-Manville at two landfills located near the plant in Marrero. One of the landfills is located on the westbank of the Mississippi River, across River Road, north of the plant, and the other landfill is located on LaPalco Boulevard. The ACM was transported to these locations by truck and dumped into the landfills. The landfills have been closed, but no information is currently available concerning their closure. An evaluation of these landfills is not included within the scope of this investigation.

Previous investigations at the WBA site included a sampling mission conducted by the LDEQ on January 12, 1990. This investigation involved the collection and analysis for asbestos of 10 bulk samples from various residential locations and one air sample using a hi-volume sampler. The portable hi-volume air sampler was positioned approximately 6 to 8 feet above ground surface on a small building at a Texaco facility on River Road. The air sampler was set at a flow rate of 28 cubic feet per minute (ft^3/min) for approximately 188 minutes. Analysis of the air sample revealed 3×10^{-7} fibers per cubic centimeter (f/cc) which is below the established EPA and Occupational Safety and Health Administration (OSHA) action level of 0.1 f/cc. Analyses of the ACM bulk samples indicated the material contained up to 60% chrysotile and crocidolite asbestos fibers. The analytical results from the LDEQ investigation is presented in the site assessment report submitted to the EPA on September 27, 1991, under TDD No. T06-9010-54.

On February 6, 1990, the LDEQ contacted the EPA Region 6 Emergency Response Branch (ERB) for assistance in investigating the potential asbestos health hazard associated with the WBA site. The EPA ERB tasked the Region 6 TAT to provide technical assistance and resources for evaluation of the WBA site. On February 8, 1990, the EPA OSC, TAT, representatives from the LDEQ, and representatives from the Louisiana Department of Health and Hospitals (LDHH) held a meeting to plan strategies for addressing the site. On February 8 and 9, 1990, the EPA OSC, TAT, and the LDEQ conducted drive-by inspections of several residential homes in Westwego, Marrero, and Gretna. TAT performed written and photographic documentation of site conditions. On February 23, 1990, TAT meet with representatives of the LDEQ Air Quality Division to plan an air sampling mission. TAT conducted air sampling of three randomly selected residential locations on March 7, 8, and 9, 1990. Sampling was conducted using hi-flow pumps at a flow rate of 10 liters per minute (L/min) with 50 millimeter (mm) conductive cowl cassettes and 25 mm, 0.8 micron pore size mixed cellulose ester filters as the collection device for a minimum duration of 4 hours. Five hi-flow air sampling pumps were utilized at each location with three pumps placed downwind and two pumps arranged upwind of the ACM. The sampling cassettes were placed on telescopic tripods approximately 5 feet above ground surface. Weather conditions during the sampling events included partly cloudy skies, temperature ranging between 70 to 80° Fahrenheit, relative humidity ranging from 50 to 60%, and predominantly southeast winds at 18 to 25 miles per hour (mph). A total of 11 air samples were collected and analyzed for asbestos fibers using PCM with three samples also analyzed for asbestos using TEM techniques. The analytical results revealed no sample contained asbestos above the detection limit or the established EPA action level of 0.1 f/cc, which at that time was one-half the OSHA standard for an 8-hour time weighted average (TWA). Additional information relating to these investigations can be found in the site assessment report submitted to the EPA on September 27, 1991, under TDD No. T06-9010-54.

On January 7, 1992, the EPA tasked the Alternative Remedial Contract Services (ARCS) contractor, M-K Environmental and ICF Technology, Inc. (MK/ICF), to conduct a Preliminary Assessment (PA) of the WBA site. The purpose of the PA was to determine if further investigations were warranted and to provide a preliminary screening of the site to facilitate EPA's assignment of site priorities. The PA identified air as the major pathway of concern. The ACM in many cases was located less than 200 feet from local residences and was easily accessible to the public. Another pathway of concern was from soil exposure since the ACM was observed to be in direct contact with the soil. The PA identified 117 residences with suspected ACM contamination; however, a full extent of contamination survey was not conducted. The PA recommended that a Site Inspection (SI) with a PreScore was needed to determine if the site was a potential candidate for the National Priorities List (NPL). Information relating to the PA can be found in the report submitted to the EPA under CERCLIS Identification No. LAD985170711 on October 16, 1992.

In October 1994, a second ARCS contractor, Roy F. Weston, conducted an SI of the WBA site. Findings included: no groundwater or surface water pathway of concern was present at the site; and analytical results of air samples indicated the presence of asbestos fibers, but at concentrations significantly below the OSHA action level of 0.1 f/cc. Due to these conclusions, the site did not qualify as a potential candidate for inclusion on the NPL of Superfund sites. A decision of No Further Action Planned (NFAP) under Superfund was recommended. However, it should be noted that the SI did not utilize the revised Superfund Chemical Data Matrix (SCDM) toxicitity value of

asbestos ranging from zero to 10,000, or the location of the ACM in school yards, day care centers, and high access areas. Additional information relating to the SI can be found in the report submitted to the EPA in March 1995 under Work Assignment No. 23-6JZZ.

In November 1995, the LDEQ conducted an inspection of the WBA site and observed that conditions had deteriorated. The ACM appeared to be more friable and had asbestos fibers outcropping from the material. At that time, the LDEQ requested additional assistance from the EPA to re-evaluate the WBA site. Based on this request, the EPA RPB tasked the START contractor to conduct removal assessment activities at the WBA site.

III. ACTIONS TAKEN

This report summarizes activities relating to the WBA site conducted after June 14, 1996. As stated previously, activities conducted prior to this date were reported to EPA as interim deliverables (Attachment A and B).

At 0850 hours on June 20, 1996, START member Troy Naquin and TM John Martin met with state representatives Debra Bendily of the LDEQ Inactive and Abandoned Site Division (IASD) and William Coltrin, Nathan Levy, and Jeff Dauzet of the LDEQ Air Quality Division at the LDEQ Southeast Regional Office in Kenner, Louisiana, to prepare for visits to the Jefferson and Orleans parish environmental departments to inform these agencies of the WBA site. At 1025 hours, all parties arrived at the Jefferson Parish Environmental and Development Control Department and met with Mrs. Marnie Winter, Director. EPA TM Martin and LDEQ representatives informed Mrs. Winter of site activities completed to date, proposed future actions, and addressed concerns she had relating to the site. At 1315 hours, all parties arrived at the City of New Orleans Mayor's Office of Environmental Affairs and briefed Mrs. Amy Clipp, Deputy Director, on the WBA site. This briefing included a synopsis of site activities completed to date, proposed future actions, and a question and answer session. The environmental departments for both parishes were informed that several public meetings with local, state, and federal officials as well as the general public would be held before any removal activities began. In addition, each parish environmental representative was requested by the EPA TM and LDEQ to inform their public works departments about the presence of ACM during street and drainage improvement projects.

On July 11, 1996, a meeting and tour of the WBA site was held with EPA officials, START members, United States Army Corps of Engineers (USACE) officials, and representatives from International Technologies Corporation (IT Corp) to plan strategies for a proposed removal action at the site. The following individuals attended the meeting and site tour: EPA Team Leader (TL) Jim Mullins, EPA TM John Martin, and EPA Remedial Project Manager (RPM) Stacey Bennett; START members Troy Naquin and Carol Geraghty; USACE officials Jude Hodzu and Steven Dawson; and IT Corp representatives Tom Mathison and Al Meyers. An initial briefing on site history and activities conducted to date was presented by EPA and START prior to the tour. The tour consisted of visits to the following locations: a residential location at (b) (6) and the Gretna No. 2 Kindergarten Center in Gretna; the Johns-Manville plant, Mississippi River levee

landfill, several residential locations, and a school in the vicinity of Eiseman and Meyers streets in Marrero; and a residential location on Avenue C and day care on Marshall Street in Westwego. The group also drove to Avondale, Louisiana, to observe the Jefferson Parish landfill and to estimate the proximity of the landfill to the western extent of the site. This distance was determined to be approximately 7.5 miles. All parties then conducted a reconnainance of two potential command post locations at the Jefferson Parish Emergency Center on Ames Boulevard in Marrero and the Harvey State Building that is owned by the State of Louisiana in Harvey.

After receiving approval from the EPA Contracting Officer and at the request of the EPA TM, START compiled and shipped technical data relating to the WBA site to the USACE for use by them and their contractors in developing a removal action plan for the site.

ATTACHMENTS:

A. Removal Assessment - Interim Report No. 1, dated May 2, 1996 (52 pages)
B. Removal Assessment - Interim Report No. 2, dated June 14, 1996 (172 pages)
C. Records of Communication (92 pages)
D. Slides (26 pages)
E. Copy of Analytical Subcontract Procurement for Reservoirs Environmental Services (36 pages)
F. Field Data Entry Sheets (1156 pages)
G. List of Federal, State, and Local Officials (6 pages)
H. Environmental Justice Report
I. Letters Authorizing Release of Data Under the START Contract (2 pages)
J. Copy of Logbook #1 Pages (1-48) and Logbook #2 Pages (1-37)
K. Copy of TDD# T06-9511-010, TDD# S06-9601-033, and Amendments A, B, C, and D (6 pages)

ATTACHMENT A
REMOVAL ASSESSMENT - INTERIM REPORT NO. 1,
DATED MAY 2, 1996
(52 PAGES)

S06-9601-033

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CERCLIS# LAD985170711
CASE# FY90-1364

REMOVAL ASSESSMENT INTERIM REPORT
FOR
WESTBANK ASBESTOS
MARRERO, JEFFERSON PARISH, LOUISIANA

May 2, 1996

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 6
Mr. Henry Thompson Jr.

Contract Number: 68-W6-0013

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CERCLIS# LAD985170711
CASE# FY90-1364

DATE: May 2, 1996

TO: *John Martin, TM*
EPA Region 6, Response and Prevention Branch

FROM: Troy M. Naquin
Region 6, Superfund Technical Assessment and Response Team

SUBJ: **Removal Assessment Interim Report: Westbank Asbestos**
Marrero, Jefferson Parish, Louisiana
TDD#: S06-9601-633
PAN#: 003501SFXX
LAT 29°53'58"N, LONG 90°06'45"W

The Westbank Asbestos (WBA) site is located on the westbank of the Mississippi River near the City of New Orleans, Louisiana. The area includes the Jefferson Parish communities of Bridge City, Westwego, Marrero, Harvey, and Gretna, and the Orleans Parish community of Algiers. The source of the asbestos contamination was from a former Johns-Manville plant that operated in Marrero near the intersection of Pine Street and 4th Street. The geographical coordinates of the intersection of Pine and 4th streets is located at 29°53'58" North, Longitude 90°06'45" West, as scaled from the United States Geological Survey (USGS) New Orleans West Quadrangle, 7.5 minute series topographic map. The map scale is 1:24,000 and is in the NAD-27 datum.

On November 21, 1995, under the Region 6 Technical Assistance Team (TAT) contract, the EPA Region 6 Response and Prevention Branch (RPB) tasked the Region 6 TAT to conduct site assessment activities at the WBA site. TAT was directed under Technical Direction Document (TDD) No. T06-9511-010 to conduct site assessment activities which included: coordinate with state and local officials as appropriate; evaluate the current status of site conditions; conduct an extent of contamination survey for asbestos using field screening techniques; estimate waste volumes; generate maps using AutoCad and/or geographical information system (GIS)computer applications; draft approaches and procedures for conducting a Human Health Risk Assessment; evaluate mitigation options for technical viability, effectiveness, and cost; and coordinate with the

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EPA Task Monitor (TM). On January 22, 1996, a new TDD (TDD No. S06-9601-033) was issued under the Superfund Technical Assessment and Response Team (START) contract to continue removal assessment activities at the WBA site. On April 3, 1996, the TDD was amended for additional elements which included: provide an interim report on May 7, 1996, including bulk and soil data, a site location map, and removal cost estimates; develop a Sampling Quality Assurance/Quality Control (QA/QC) Plan for bulk and soil sampling; and implement the Sampling QA/QC Plan. On April 10, 1996, the TDD was amended again to provide analytical services for the collection of 60 bulk samples for analysis of asbestos by polarized light microscopy (PLM) and the collection of 30 soil samples for analysis of asbestos by transmission electron microscopy (TEM). This interim report only addresses the requirements for the May 7, 1996, deliverables.

As requested by the EPA TM, a site location map was prepared indicating the area potentially affected by asbestos contamination (Attachment A)

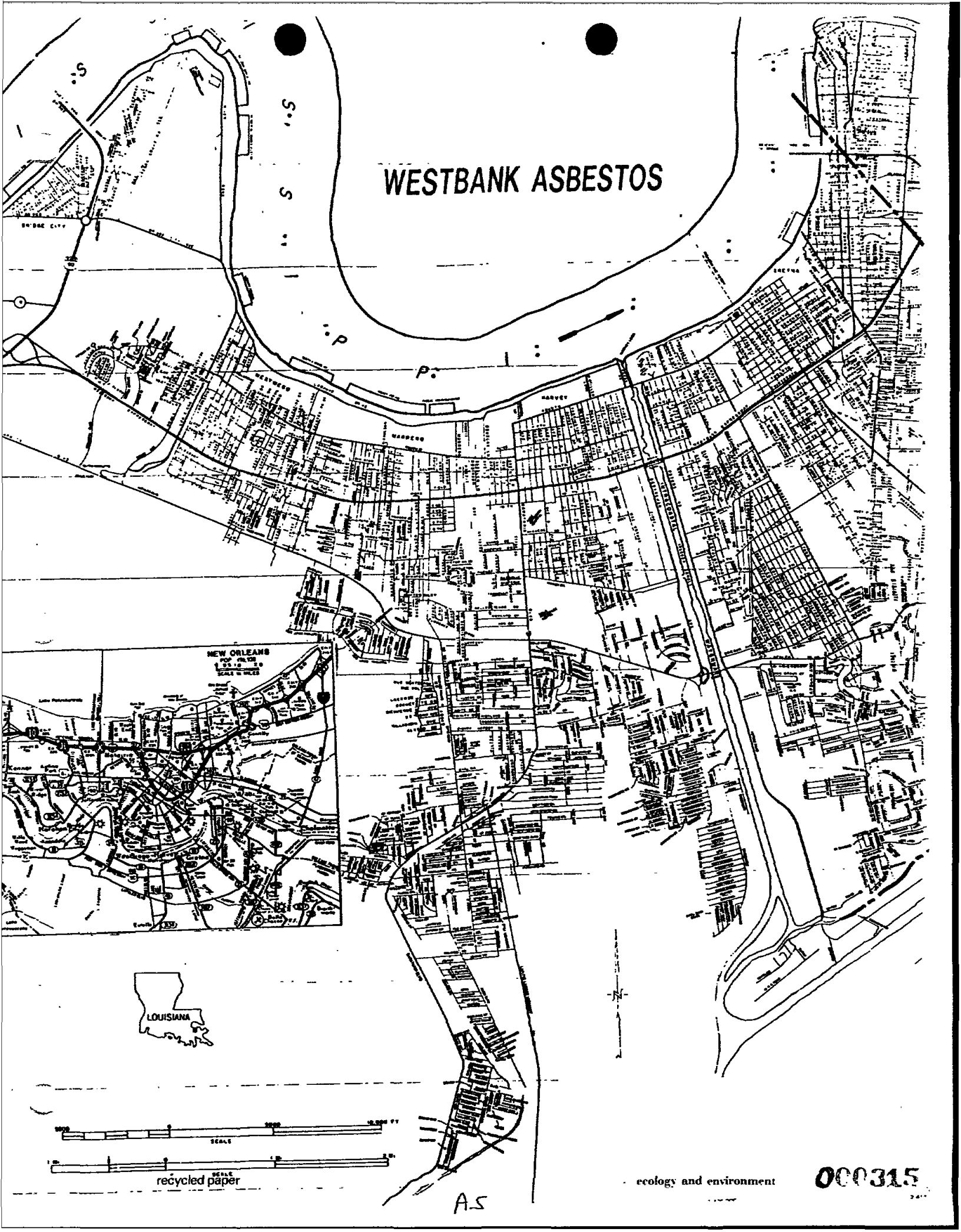
From April 15 through 18, 1996, START and representatives from the Louisiana Department of Environmental Quality (LDEQ) mobilized to the WBA site to collect bulk and soil samples for asbestos during an expanded Phase I removal assessment. Prior to site activities, START developed a Sampling QA/QC Plan which detailed sampling methodologies and objectives. LDEQ representatives collected all samples during this phase of the removal assessment. START assisted in sample location selection and provided written and photographic documentation as well as sample handling, documentation, and packaging. START shipped the bulk and soil samples to Reservoirs Environmental Services, a START procured laboratory, for asbestos analysis by PLM (EPA Method 600/R-93/116) and TEM (EPA Method 600/R-93/116, Chatfield Method), respectively. The analytical results of the bulk and soil samples are presented in Attachments B and C.

Using information collected from the initial Phase I removal assessment conducted from February 7 through March 1,1996, and site visits on April 29, 1996, and from April 15 through 18, 1996, calculations of waste volumes and estimates for removal costs were evaluated and are presented in Attachments E, F, G, and H.

ATTACHMENTS:

A. Site Location Map
B. Analytical Data of Bulk Samples (10 pages)
C. Analytical Data of Soil Samples (7 pages)
D. Copy of Chain of Custody Records (7 pages)
E. Removal Cost Estimates (2 pages)
F. Vendor Records of Communication for Removal Cost Estimates (8 pages)
G. Calculations of Waste Volume Estimates
H. Calculations of InSitu Density of the Asbestos-Containing Material (4 pages)

ATTACHMENT A
SITE LOCATION MAP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ATTACHMENT B
ANALYTICAL DATA OF BULK SAMPLES
(10 PAGES)

NVLAP

ASBESTOS SAMPLE ANALYSIS
-TEM/SEM/XRD
-PCM/PLM
ENVIRONMENTAL SITE ASSESSMENTS
WETLANDS DELINEATION

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

1147 BRITTMOORE RD., SUITE 112 HOUSTON, TEXAS 77043 (713) 932-0016 FAX: 713/984-0963

April 27, 1996

Mr. Troy Naquin
Ecology & Environment
11550 Newcastle Avenue, Suite 250
Baton Rouge, LA 70816

RE: Job No. RESH 9069 - Your Job "Westbank Asbestos/0035015SFG1" - Bulk Samples: WAB-041501, 041502, 041503, 041504, 041505, 041506, 041507, 041508, 041609, 041610, 041611, 041612, 041613, 041614, 041615, 041616, 041617, 041618, 041619, 041620, 041621, 041622, 041623, 041624, 041625, 041626, 041627, 041628, 041629, 041630, 041631, 041732, 041733, 041734, 041735, 041736, 041737, 041738, 041739, 041740, 041741, 041742, 041743, 041744, 041745, 041746, 041747, 041748, 041749, 041750, 041851, 041852, 041853, 041854, 041855, 041856, 041857, 041858, 041859, 041860, 041504QC, 041611QC, 041739QC,

Dear Mr. Naquin:

Reservoirs Environmental Services, Inc. (RESI) has analyzed sixty-three bulk material samples by Polarized Light Microscopy (PLM) for asbestos content as per your request. The samples were received on April 22, 1996, and analytical results were forwarded to you within 5 days. PLM was used to analyze the bulk materials in compliance with guidelines established by the USEPA (40 CFR Part 763.115). The results described in this report apply only to the samples analyzed. The Analytical Results are presented in Table I.

RESI has assigned job number RESH 9069 to this study. This report is considered highly confidential and the sole property of Ecology & Environment. RESI will not discuss any part of this study with personnel other than those of the client company. The report must not be used to claim endorsement of products or analytical results by NVLAP or any other agency of the U.S. Government.

The US EPA in a Federal Register notice dated August 1, 1994, announced the availability of an improved bulk sample analysis method "Method for the Determination of Asbestos in Bulk Building Material" (EPA/600/R-93/116).

> ***The new method is particularly applicable to bulk materials that contain a large amount of interfering materials that can be removed by ashing and/or dissolution***

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and contain asbestos fibers that are not resolved by PLM techniques. Analytical electron microscopy (AEM) can often be a reliable method for the detection and positive identification of asbestos in some bulk building materials, both friable and nonfriable. Many floor tiles and plasters would be included in this type of sample.

If you should have any questions about this report, please feel free to call me at 713/932-0015.

Sincerely,

Richard K. Harding
Manager - Houston Division

RKH:mt

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RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896-01, TDH Licensed Laboratory #30-0015

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
Client Project: WESTBANK ASBESTOS/0035015SFG1
Date Samples Received: 22-Apr-96
Analysis Type: PLM
Turnaround: 5 DAY

NOTE: The US EPA requires use of stratified analysis for NESHAP and AHERA compliance. Composite results only apply for specific exceptions.

Client Sample Number	Lab ID Number	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER: Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%): CELL	GLASS	SYNTH	HAIR	WOLL	TALC	OTHER	Non-Fibrous Components (%)
WAB-041501	67010	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	40 5	TR	0	0	0	0	0	0	55
WAB-041502	67011	A	Black fibrous tar w/sand	40		ND	25	TR	0	0	0	0	0	75
		B	Black fibrous tar	60		ND	2	25	0	0	0	0	0	73
WAB-041503	67012	A	Gray fibrous plaster material	100	Chrysotile Crocidolite	30 5	2	0	0	0	0	0	0	63
WAB-041504	67013	A	Gray fibrous plaster material	100	Chrysotile Crocidolite	30 10	2	0	0	0	0	0	0	60
WAB-041505	67014	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	30 10	2	0	0	0	0	0	0	58
WAB-041506	67015	A	Gray fibrous plaster material	100	Chrysotile Crocidolite Amosite	35 10 TR	2	0	0	0	0	0	0	51
WAB-041507	67016	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	30 5	2	0	0	0	0	0	0	68
WAB-041508	67017	A	Off-White fibrous plaster material	100	Chrysotile Crocidolite	40 5	2	0	0	0	0	0	0	53

ND = None Detected CELL = Cellulose WOLL = Wollastonite GYP = Gypsum TR = Trace (<1%) Mat = Material BRUC = Brucite
Trem-Act = Tremolite-Actinolite SYNTH = Synthetic Data QA: [signature] Analyst: [signature]

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RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896-01, TDH Licensed Laboratory #30-0015

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
Client Project: WESTBANK ASBESTOS/0035015SFG1
Date Samples Received: 22-Apr-96
Analysis Type: PLM
Turnaround: 5 DAY

Client Sample Number	Lab ID Number	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOLL	TALC	OTHER	Non-Fibrous Components (%)
WAB-041609	67018	A	Off-White fibrous plaster material	100	Chrysotile Crocidolite Amosite	25 10 TR	2	0	0	0	0	0	0	63
WAB-041610	67019	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 10	2	0	0	0	0	0	0	53
WAB-041611	67020	A	Black fibrous granular tar	100		ND	2	15	0	0	0	0	0	83
WAB-041612	67021	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 10	TR	0	0	0	0	0	0	55
WAB-041613	67022	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 10	TR	0	0	0	0	0	0	55
WAB-041614	67023	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 10	TR	0	0	0	0	0	0	55
WAB-041615	67024	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	30 5	2	0	0	0	0	0	0	63
WAB-041616	67025	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite Amosite	35 10 6	TR	0	0	0	0	0	0	49

ND = None Detected
Trem-Act = Tremolite-Actinolite
CELL = Cellulose WOLL = Wollastonite
SYNTH = Synthetic
GYP = Gypsum
Date QA:
TR = Trace Mat = Material BRUC = Brucite
Analyst:

B-4 A/C

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RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896-01, TDH Licensed Laboratory #30-0015

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
Client Project: WESTBANK ASBESTOS/0035015SFG1
Date Samples Received: 22-Apr-96
Analysis Type: PLM
Turnaround: 5 DAY

Client Sample Number	Lab ID Number	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOOL	TALC	OTHER	Non-Fibrous Components (%)
WAB-041617	67026	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041618	67027	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041619	67032	A	Gray fibrous tar material w/Brown granular top	100		ND	TR	10	0	0	0	0	0	90
WAB-041620	67033	A	Black fibrous tar material w/Brown granular top	100		ND	0	10	0	0	0	0	0	90
WAB-041621	67034	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041622	67035	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041623	67036	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041624	67037	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041625	67038	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60

ND = None Detected CELL = Cellulose WOLL = Wollastonite GYP = Gypsum TR = Trace Mat = Material BRUC = Brucite
Trem-Act = Tremolite-Actinolite SYNTH = Synthetic Data QA:

Analyst:

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ecology and environment

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RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896-01, TDH Licensed Laboratory #30-0015

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
Client Project: WESTBANK ASBESTOS/0035015SFG1
Date Samples Received: 22-Apr-96
Analysis Type: PLM
Turnaround: 5 DAY

Client Sample Number	Lab ID Number	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOOL	TALC	OTHER	Non-Fibrous Components (%)
WAB-041626	67039	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	TR	0	0	0	0	0	0	60
WAB-041627	67040	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 10	TR	0	0	0	0	0	0	55
WAB-041628	67041	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 5	2	0	0	0	0	0	0	58
WAB-041629	67042	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 10	TR	0	0	0	0	0	0	55
WAB-041630	67043	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 5	TR	0	0	0	0	0	0	60
WAB-041631	67044	A	Gray fibrous plaster material	100	Chrysotile Crocidolite	35 5	TR	0	0	0	0	0	0	60
WAB-041732	67048	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	TR	0	0	0	0	0	0	60
WAB-041733	67049	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	TR	0	0	0	0	0	0	60

ND = None Detected CELL = Cellulose WOLL = Wollastonite GYP = Gypsum TR = Trace Mat = Material BRUC = Brucite
Trem-Act = Tremolite-Actinolite SYNTH = Synthetic Data QA: Analyst:

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RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896-01, TDH Licensed Laboratory #30-0015

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
Client Project: WESTBANK ASBESTOS/0035015SFG1
Date Samples Received: 22-Apr-96
Analysis Type: PLM
Turnaround: 5 DAY

Client Sample Number	Lab ID Number	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOLL	TALC	OTHER	Non-Fibrous Components (%)
WAB-041734	67050	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041735	67052	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	TR	0	0	0	0	0	0	60
WAB-041736	67053	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041737	67057	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041738	67060	A	Gray fibrous plaster material	100	Chrysotile Crocidolite	35 10	TR	0	0	0	0	0	0	55
WAB-041739	67061	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 10	0	0	0	0	0	0	0	55
WAB-041740	67062	A	Gray fibrous cementitious material	100	Chrysotile Crocidolite	35 10	TR	0	0	0	0	0	0	55
WAB-041741	67063	A	Gray fibrous cementitious material w/Black paint	50	Chrysotile	30	TR	0	0	0	0	0	0	70
		B	Gray fibrous plaster material	50	Chrysotile	45	2	0	0	0	0	0	0	53

ND = None Detected
Trem-Act = Tremolite-Actinolite
CELL = Cellulose WOLL = Wollastonite
SYNTH = Synthetic
GYP = Gypsum
TR = Trace Mat = Material BRUC = Brucite
Date QA:
Analyst:

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896-01, TDH Licensed Laboratory #30-0015

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
Client Project: WESTBANK ASBESTOS/0035015SFG1
Date Samples Received: 22-Apr-96
Analysis Type: PLM
Turnaround: 5 DAY

Client Sample Number	Lab ID Number	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOLL	TALC	OTHER	Non-Fibrous Components (%)
WAB-041742	67064	A	Gray fibrous cementitious material	100	Chrysotile	35	TR	0	0	0	0	0	0	55
					Crocidolite	10								
WAB-041743	67065	A	Gray fibrous plaster material	100	Chrysotile	30	3	0	0	0	0	0	0	60
					Crocidolite	5								
					Amosite	2								
WAB-041744	67066	A	Gray fibrous cementitious material	100	Chrysotile	35	2	0	0	0	0	0	0	58
					Crocidolite	5								
WAB-041745	67067	A	Gray fibrous cementitious material	100	Chrysotile	35	0	0	0	0	0	0	0	55
					Crocidolite	10								
WAB-041746	67068	A	Gray fibrous cementitious material	100	Chrysotile	35	2	0	0	0	0	0	0	53
					Crocidolite	10								
WAB-041747	67075	A	Gray fibrous plaster	3	Chrysotile	30	0	0	0	0	0	0	0	70
					Crocidolite	10								
		B	Black fibrous tar material w/Brown granular top	97		ND	0	10	0	0	0	0	0	90
WAB-041748	67076	A	Gray fibrous plaster	100	Chrysotile	30	0	0	0	0	0	0	0	60
					Crocidolite	10								

ND = None Detected
Trem-Act = Tremolite-Actinolite
CELL = Cellulose WOLL = Wollastonite GYP = Gypsum
SYNTH = Synthetic
TR = Trace Mat = Material BRUC = Brucite
Data QA:
Analyst:

B-8 AN

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RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896-01, TDH Licensed Laboratory #30-0015

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
Client Project: WESTBANK ASBESTOS/003501SFG1
Date Samples Received: 22-Apr-96
Analysis Type: PLM
Turnaround: 5 DAY

NOTE: The US EPA requires use of stratified analysis for NESHAP and AHERA compliance. Composite results only apply for specific exceptions.

Client Sample Number	Lab ID Number	Layer	Physical Description	Portion of Total Sample (%)	Asbestos Content by Layer: Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%): CELL	GLASS	SYNTH	HAIR	WOLL	TALC	OTHER	Non-Fibrous Components (%)
WAB-041749	67077	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041750	67078	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041851	67083	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041852	67084	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041853	67085	A	Gray fibrous plaster	100	Chrysotile	40	0	0	0	0	0	0	0	60
WAB-041854	67086	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041855	67087	A	Gray fibrous plaster	100	Chrysotile Crocidolite Amosite	30 10 TR	0	0	0	0	0	0	0	60
WAB-041856	67088	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60

ND = None Detected CELL = Cellulose WOLL = Wollastonite GYP = Gypsum TR = Trace (<1%) Mat = Material BRUC = Brucite
Trem-Act = Tremolite-Actinolite SYNTH = Synthetic Date QA: [illegible] Analyst: [signature]

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP Accredited Laboratory #1896-01, TDH Licensed Laboratory #30-0015

TABLE I. PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
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Date Samples Received: 22-Apr-96
Analysis Type: PLM
Turnaround: 5 DAY

Client Sample Number	Lab ID Number	Layer	Physical Description	Portion of Total Sample (%)	ASBESTOS CONTENT BY LAYER Mineral	Visual Estimate (%)	Non-Asbestos Fibrous Components (%) CELL	GLASS	SYNTH	HAIR	WOLL	TALC	OTHER	Non-Fibrous Components (%)
WAB-041857	67089	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041858	67090	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041859	67096	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041860	67097	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	0	0	0	0	0	0	0	60
WAB-041504QC	67013QC	A	Gray fibrous plaster	100	Chrysotile Crocidolite	35 10	TR	0	0	0	0	0	0	55
WAB-041611QC	67020QC	A	Black fibrous granular tar material	100		ND	4	11	0	0	0	0	0	85
WAB-041739QC	67061QC	A	Gray fibrous plaster	100	Chrysotile Crocidolite	30 10	TR	0	0	0	0	0	0	60

ND = None Detected
Trem-Act = Tremolite-Actinolite
CELL = Cellulose WOLL = Wollastonite GYP = Gypsum
SYNTH = Synthetic Data QA: RLN
TR = Trace Mat = Material BRUC = Brucite
Analyst: Jerry Brindley

B-10 #14

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ATTACHMENT B
REMOVAL ASSESSMENT - INTERIM REPORT NO. 2,
DATED JUNE 14, 1996
(172 PAGES)

CERCLIS# LAD985170711
CASE# FY90-1364

REMOVAL ASSESSMENT - INTERIM REPORT NO. 2
FOR
WESTBANK ASBESTOS
MARRERO, JEFFERSON PARISH, LOUISIANA

June 14, 1996

Prepared for:

U.S. Environmental Protection Agency
Region 6
Program Management Branch
Mr. Henry Thompson, Jr.
Project Officer

Contract Number: 68-W6-0013

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International Specialists in the Environment

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International Specialists in the Environment

CERCLIS# LAD985170711
CASE# FY90-1364

DATE: June 14, 1996

TO: John Martin, TM
EPA Region 6, Response and Prevention Branch

THRU: Henry Thompson, Jr., PO
EPA Region 6, Program Management Branch

THRU: Chris Quina, STL
Region 6, Superfund Technical Assessment and Response Team

FROM: Troy M. Naquin
Region 6, Superfund Technical Assessment and Response Team

SUBJ: Removal Assessment - Interim Report No. 2: Westbank Asbestos
Marrero, Jefferson Parish, Louisiana
TDD#: S06-9601-033 (previously TDD# T06-9511-010)
PAN#: 003501SFXX
LAT 29°53'58"N, LONG 90°06'45"W

I. INTRODUCTION

The Westbank Asbestos (WBA) site is located on the westbank of the Mississippi River near the City of New Orleans, Louisiana. The site includes residential and commercial properties contaminated with asbestos in the Jefferson Parish communities of Bridge City, Westwego, Marrero, Harvey, and Gretna and the Orleans Parish community of Algiers (Attachment A). The source of the asbestos contamination was from the Johns-Manville plant located in Marrero, Jefferson Parish, Louisiana. The geographic coordinates near the south entrance to the former Johns-Manville plant (corner of 4th and Pine streets) resides at Latitude 29°53'58" North, Longitude 90°06'45" West, as scaled from the United States Geological Survey (USGS) New

Orleans East and New Orleans West quadrangle, 7.5 minute series topographic maps. For these maps the scale is 1:24,000 and is in the North American Datum - 27 (NAD-27).

On November 11, 1995, the EPA Region 6 Response and Prevention Branch (RPB) tasked the Technical Assistance Team (TAT) contractor to conduct site assessment activities at the WBA site under Technical Direction Document (TDD) No. T06-9511-010. TAT was directed to: coordinate with state and local officials as appropriate; evaluate current site conditions; conduct an extent of contamination survey for asbestos; estimate waste volumes; generate AutoCad and/or Graphic Information System (GIS) site maps; draft approach and procedures for conducting a Human Health Risk Assessment (HHRA); evaluate mitigation options for technical viability, effectiveness, and cost; and coordinate with the EPA On-Scene Coordinator(OSC)/Task Monitor (TM) John Martin. Due to a change in the EPA technical assistance contract in early 1996, assigned tasks were continued under the Superfund Technical Assessment and Response Team (START) contract under replacement TDD No. S06-9601-033 issued on January 22, 1996. On April 4, 1996, EPA TM Martin assigned additional specific elements to the TDD which included: procure analytical services for 60 bulk samples for asbestos analysis by polarized light microscopy (PLM) and 30 soil samples for asbestos analysis by transmission electron microscopy (TEM); develop a Sampling Quality Assurance/Quality Control (QA/QC) Plan for the collection and analysis of bulk and soil samples; implement Sampling QA/QC Plan; and submit an interim report by May 7, 1996, to include analytical results of bulk and soil sampling, a site location map, and calculations of removal cost estimates. On May 20, 1996, EPA TM Martin determined that drafting an approach and procedures for conducting the HHRA would not be needed at this time and verbally stopped- work on that task. On May 28, 1996, EPA TM Martin tasked START to submit a second interim report by June 14, 1996, to include results of all tasks and information collected to date.

This current deliverable represents the second interim report and includes a synopsis of work activities conducted through June 14, 1996. All interim reports and remaining deliverables will be provided as attachments to the final report to be submitted to the EPA by the assigned completion date.

II. BACKGROUND

Asbestos is a naturally occurring mineral that was utilized in a wide variety of industrial products. Asbestos represents a group of silicate minerals that readily separates into thin, strong fibers that are flexible, heat resistant, and chemically inert. Asbestos minerals are divided into two groups that are distinguished by their crystalline structures. These groups include: serpentine minerals that have a sheet or layered structure; and amphiboles that have a chain-like structure. Serpentine minerals consists of chrysotile which is the most commonly used type of asbestos and accounts for approximately 95% of asbestos used in manufacturing. Amphibole minerals consists of five types of asbestos which include: amosite, crocidolite, anthophyllite, tremolite, and actinolite. Health studies have showed that exposure to amosite and crocidolite asbestos, due to their short,

rigid, fibrous nature, results in the greatest potential risk of contracting an asbestos-related disease. The WBA site consists of asbestos waste material contaminated with chrysotile, crocidolite, and amosite fibers.

Background information for the WBA site was gathered from the Louisiana Department of Environmental Quality (LDEQ) and interviews conducted in the field with local residents and former employees of the Johns-Manville plant. The WBA site consists of residential and commercial properties contaminated with asbestos in the Jefferson Parish communities of Bridge City, Westwego, Marrero, Harvey, and Gretna and the Orleans Parish community of Algiers. The source of the asbestos was from a Johns-Manville plant that operated in Marrero, Jefferson Parish, Louisiana. The plant consisted of many operation and manufacturing buildings located on approximately 56 acres of land (Attachment B). The plant is bordered by the Mississippi River to the north, commercial facilities to the west, and residential communities to the south and east. The residential communities surrounding the plant in the westbank area are the focus of this investigation. The 1995 population of the westbank communities as stated in *The Source of Zip Code Demographics; 10th Edition,* includes: Westwego - 11,163; Marrero - 63,025; Harvey - 37,234; and Gretna - 57,112. The 1990 federal census list the population of Bridge City at 8,327 and population within the area of concern in Algiers as 5,611.

Johns-Manville operated the plant in Marrero from 1929 to 1975 which produced various types of asbestos-containing products. These products included an asphalt roofing tile, several varieties of transite materials, and other asbestos-containing products. An asbestos-containing aggregate was generated as a by-product during manufacturing operations. The aggregate was pulverized in a hammer mill and mixed with a filler, usually composed of gypsum, dolomite, or calcite, to form a stable road-bed-like material. This asbestos-containing material (ACM) was then offered to local residents, free-of-charge, for construction of driveways, servitudes, walkways, and other areas. Consequently, many of these areas in the residential communities surrounding the Johns-Manville plant contain ACM waste. The ACM is visually recognizable by its light bluish-grey, cementitious texture. No records are currently available concerning the quantity of ACM and the exact time period in which the ACM was distributed to the public. The ACM waste was also disposed of by Johns-Manville at two landfills located near the plant in Marrero. One of the landfills is located on the westbank of the Mississippi River, across River Road, north of the plant, and the other landfill is located on LaPalco Boulevard. The ACM was transported to these locations by truck and dumped into the landfills. The landfills have been closed, but no information is currently available concerning their closure. An evaluation of these landfills is not included within the scope of this investigation.

Previous investigations at the WBA site included a sampling mission conducted by the LDEQ on January 12, 1990. This investigation involved the collection and analysis for asbestos of 10 bulk samples from various residential locations and one air sample using a hi-volume sampler. The portable hi-volume air sampler was positioned approximately 6 to 8 feet above ground surface on a small building at a Texaco facility on Barataria Blvd. The air sampler was set at a flow rate of 28 cubic feet per minute (ft^3/min) for approximately 188 minutes. Analysis of the air sample revealed

3 x 10^{-7} fibers per cubic centimeter (f/cc) which is below the established EPA and Occupational Safety and Health Administration (OSHA) action level of 0.1 f/cc. Analyses of the ACM bulk samples indicated the material contained up to 60% chrysotile and crocidolite asbestos fibers. The analytical results from the LDEQ investigation is presented in the site assessment report submitted to the EPA on September 27, 1991, under TDD No. T06-9010-54.

On February 6, 1990, the LDEQ contacted the EPA Region 6 Emergency Response Branch (ERB) for assistance in investigating the potential asbestos health hazard associated with the WBA site. The EPA ERB tasked the Region 6 TAT to provide technical assistance and resources for evaluation of the WBA site. On February 8, 1990, the EPA OSC, TAT, representatives from the LDEQ, and representatives from the Louisiana Department of Health and Hospitals (LDHH) held a meeting to plan strategies for addressing the site. On February 8 and 9, 1990, the EPA OSC, TAT, and the LDEQ conducted drive-by inspections of several residential homes in Westwego, Marrero, and Gretna. TAT performed written and photographic documentation of site conditions. On February 23, 1990, TAT meet with representatives of the LDEQ Air Quality Division to plan an air sampling mission. TAT conducted air sampling of three randomly selected residential locations on March 7, 8, and 9, 1990. Sampling was conducted using hi-flow pumps at a flow rate of 10 liters per minute (L/min) with 50 millimeter (mm) conductive cowl cassettes and 25 mm, 0.8 micron pore size mixed cellulose ester filters as the collection device for a minimum duration of 4 hours. Five hi-flow air sampling pumps were utilized at each location with three pumps placed downwind and two pumps arranged upwind of the ACM. The sampling cassettes were placed on telescopic tripods approximately 5 feet above ground surface. Weather conditions during the sampling events included partly cloudy skies, temperature ranging between 70 to 80° Fahrenheit, relative humidity ranging from 50 to 60%, and predominantly southeast winds at 18 to 25 miles per hour (mph). A total of 11 air samples were collected and analyzed for asbestos fibers using PCM with three samples also analyzed for asbestos using TEM techniques. The analytical results revealed no sample contained asbestos above the detection limit or the established EPA action level of 0.1 f/cc, which at that time was one-half the OSHA standard for an 8-hour time weighted average (TWA). Additional information relating to these investigations can be found in the site assessment report submitted to the EPA on September 27, 1991, under TDD No. T06-9010-54.

On January 7, 1992, the EPA tasked the Alternative Remedial Contract Services (ARCS) contractor, M-K Environmental and ICF Technology, Inc. (MK/ICF), to conduct a Preliminary Assessment (PA) of the WBA site. The purpose of the PA was to determine if further investigations were warranted and to provide a preliminary screening of the site to facilitate EPA's assignment of site priorities. The PA identified air as the major pathway of concern. The ACM in many cases was located less than 200 feet from local residences and was easily accessible to the public. Another pathway of concern was from soil exposure since the ACM was observed to be in direct contact with the soil. The PA identified 117 residences with suspected ACM contamination; however, a full extent of contamination survey was not conducted. The PA recommended that a Site Inspection (SI) with a PreScore was needed to determine if the site was a potential candidate for the National Priorities List (NPL). Information relating to the PA can be found in the report submitted to the EPA under CERCLIS Identification No. LAD985170711 on October 16, 1992.

In October 1994, a second ARCS contractor, Roy F. Weston, conducted a SI of the WBA site. Findings included: no groundwater or surface water pathway of concern was present at the site; and analytical results of air samples indicated the presence of asbestos fibers, but at concentrations significantly below the EPA action level of 0.1 f/cc. Due to these conclusions, the site did not qualify as a potential candidate for inclusion on the NPL of Superfund sites. A decision of No Further Action Planned (NFAP) under Superfund was recommended. However, it should be noted that the SI did not utilize the revised Superfund Chemical Data Matrix (SCDM) toxicitity value of asbestos ranging from zero to 10,000, or the location of the ACM in school yards, day care centers, and high access areas. Additional information relating to the SI can be found in the report submitted to the EPA in March 1995 under Work Assignment No. 23-6JZZ.

In November 1995, the LDEQ conducted an inspection of the WBA site and observed that conditions had deteriorated. The ACM appeared to be more friable and had asbestos fibers outcropping from the material. At that time, the LDEQ requested additional assistance from the EPA to re-evaluate the WBA site.

III. ACTIONS TAKEN

On November 30, 1995, TAT member Troy Naquin met with Debra Bendily, Coordinator of the LDEQ Office of Legal Affairs and Enforcement, Inactive and Abandoned Sites Division (IASD) to plan strategies for the site assessment. TAT and LDEQ discussed the role that each party would contribute to the project as approved by the EPA OSC John Martin. On December 12, 1995, TAT Naquin, LDEQ-IASD Bendily, and John Sharp of the LDEQ Southeast Regional Office, Air Quality Compliance Division conducted a site reconnaissance to investigate current site conditions and plan for the extent of contamination survey. TAT briefed LDEQ representative Sharp on the proposed site assessment activities for the project. TAT and LDEQ conducted a visit to the Johns-Manville landfill on the westbank of the Mississippi River in Marrero. TAT documented current conditions of the landfill including overgrown vegetation and damage to the fence. TAT did not enter the landfill or observe any ACM from the fence line of the landfill. A local resident next to the landfill informed the LDEQ that during a high water event, a barge broke loose and hit the landfill fence. TAT observed suspect asbestos-containing, asphaltic material outcropping along the ditch on River Road near the former plant area. TAT and the LDEQ conducted drive-by assessments of several residential locations to observe and document current conditions of the ACM. TAT and the LDEQ noted that the condition of the ACM had deteriorated since the past site visits in 1990. TAT performed written, photographic, and video documentation of the landfill and at each of the residential locations observed.

On December 19, 1995, TAT Naquin and OSC Martin met with LDEQ-IASD Bendily and William Coltrin of LDEQ Air Quality Division, Program Manager for Asbestos and Lead at the LDEQ headquarters in Baton Rouge, Louisiana, to discuss the specifics of the project. It was decided that the LDEQ would accompany TAT during an upcoming Phase I Removal Assessment and be in charge of public relations. The TAT (later completed by START) prepared a detailed

work plan describing the scope of work to be conducted during the Phase I Removal Assessment (Attachment F).

On February 7 through March 1, 1996, START members Naquin and Greg Day mobilized to the WBA site and began Phase I Removal Assessment activities. Phase I activities included conducting a visual extent of ACM contamination survey and estimating the ACM waste volume at each location. The suspect ACM identified during the survey consisted of two types of material: a black, asphalt-like material; and a light bluish-grey, cementitious material that was easily distinguishable from concrete. Waste volume estimates were collected at each location by measuring the area of visual ACM contamination with a tape measure and assuming a thickness of 6 inches as reported to START by the LDEQ. Several representatives of the LDEQ, including Debra Bendily, John Sharp, Mickey Drury, and Jeff Dauzat, accompanied START at various times during the four week assessment. LDEQ Bendily obtained hard copies of GIS generated maps of the westbank area from the Jefferson Parish Department of Information Systems Management (JPDIS). These maps were utilized to locate residential and commercial sites suspected to contain ACM. START and LDEQ performed a systematic ACM survey of the westbank area by conducting drive-by inspections of all targeted streets. Areas that were post-1965 constructed were avoided since the ACM was reportedly not used after that year. At each suspect ACM location, information was recorded on a data entry sheet which included: a tracking number assigned to the location; date and time of the inspection; names of the inspectors; names of the property owner (if available) and address of the residential or commercial location; a description of the ACM at the location; and a site sketch to illustrate the location of the ACM relative to structures. Also at each location, START and the LDEQ measured the surface area of visual ACM to aid in estimating the amount of ACM waste present at the site and marked the ACM locations on the hard copy GIS generated maps. On March 1, 1996, START and LDEQ completed the ACM survey in which 603 suspect locations were identified including three schools and three day care centers in Jefferson Parish.

On February 23, 1996, START members Naquin and Day and LDEQ representatives Bendily and Sharp escorted EPA TM Martin and LDEQ representatives William Coltrin and Nathan Levy on a site tour of the ACM locations. The tour was conducted to familiarize TM Martin and LDEQ Coltrin and Levy on site activities conducted by START and the LDEQ to date and to observe the current condition of the ACM.

On March 12, 1996, a list of all surveyed residential and commercial locations was sent to the Jefferson Parish Tax Assessor's Office (JPTAO) for identification of property owners and current mailing addresses. Once START received this information from the JPTAO, it was entered into a computer data base mangement system along with the information collected during the Phase I Removal Assessment (Attachment D). Phone numbers of identified property owners were collected by START and incorporated into the data base.

On April 22, 1996, START received the drawing exchange format (DXF) electronic files of the westbank area from the JPDIS and converted these files into GIS files. Field data collected on

the hard copy GIS generated maps by START during the survey were electronically incorporated onto the converted DXF files to generate final GIS maps of suspect ACM locations (Attachment B).

On March 29, 1996, START members Day, John Mueller, and Will Farrar mobilized to the WBA site to conduct *in situ* density tests. Density tests were conducted at three locations in Marrero including: (b)(6) (b)(6), (b)(6)(b)(6) and at a new location reported by LDEQ at (b)(6) (b)(6). An average density of 1.35 cubic yards per ton (yd^3/ton) was estimated for the ACM waste. START also identified another ACM location bringing the total to 605 locations. The calculations and results of the density tests were included as Attachment H of the first Removal Assessment Interim Report submitted to EPA TM Martin on May 2, 1996.

On April 4, 1996, START members Naquin and Maxine LaPierre presented information on the WBA site to the Region 6 EPA and the Agency for Toxic Substances and Disease Registry (ATSDR) at a meeting in Dallas, Texas. Attendees at the presentation included: EPA Region 6 RPB representatives John Martin, Chris Petersen, Charlie Gazda, Jim Mullins, and Ragan Broyles; EPA Region 6 Air Toxic Enforcement representatives Toni Allen and Martin Brittain; and ASTDR representative Bobbie Erlwein. START briefed EPA and ASTDR on the site history, previous investigations, and actions taken to date. START presented a slide show that illustrated the many uses of the ACM by the residences including driveway, servitude, and walkway construction, and a visual account of current site conditions. START received additional tasking from EPA TM Martin during a separate meeting that day to procure laboratory services for the analysis of 60 bulk and 30 soil samples for asbestos to be collected at the WBA site by START and the LDEQ. The LDEQ would collect the bulk and soil samples and START would assist through selection of sample location, sample documentation, and written and photographic documentation. EPA TM Martin also tasked START to submit the first interim report by May 7, 1996, to include analytical results of the bulk and soil samples, removal cost estimates, and a site location map.

On April 15, 1996, START Naquin and LDEQ representatives Bendily and Sharp mobilized to the WBA site to begin collecting asbestos samples. Prior to conducting sampling activities, START prepared a Sampling QA/QC Plan (Attachment G) and procured laboratory services for the analysis of 60 bulk samples for asbestos by PLM, EPA Method 600/R-93/116, and the analysis of 30 soil samples for asbestos by TEM, EPA Method 600/R-93/116 - Chatfield Method. Areas that were targeted for asbestos sampling included: locations around schools and day care centers; high access areas such as servitudes and play areas; visibly friable ACM areas; and areas that had defined drainage pathways. LDEQ Bendily collected all asbestos samples while START Naquin provided written and photographic documentation, sample documentation, and sample packaging. Two types of suspect asbestos bulk material were targeted for sampling which included a black, asphalt-like material and a light bluish-grey, cementitious material. During the asbestos sampling mission, two additional locations containing suspect ACM were identified bringing the current total to 607 locations. On April 18, 1996, START and LDEQ completed collecting the 60 bulk and 30 soil samples from the WBA site. One soil sample was substituted

for a bulk sample for asbestos analysis by TEM. On April 19, 1996, START shipped the asbestos samples to Reservoirs Environmental Services in Houston, Texas, for analysis. The procurement of analytical services for the WBA site will be presented in the final report to be submitted to the EPA at a later date. The analytical results revealed that no asbestos was present in the asphaltic bulk samples; however, asbestos was present in the light bluish-grey, cementitious material and in all of the soil samples. The average percentage of asbestos found in the light bluish-grey, cementitious, bulk samples are: chrysotile - 32.3%, crocidolite - 9.1%, and amosite - 1.6%. The average percentage of asbestos found in the soil samples are: chrysotile - 26.6% and amphiboles - 25.2%. The analytical results of the bulk and soil samples were presented in Attachments B and C in the first Removal Assessment Interim Report submitted to EPA TM Martin on May 2, 1996.

On April 24, 1996, START Naquin mobilized to the WBA site to conduct a survey for ACM at schools in the westbank area. LDEQ representative Sharp accompanied START on the survey. START and LDEQ visited most of the pre-1965 constructed public or private schools and identified ACM at the following locations: Immaculata High School in Marrero; St. Joseph the Worker School in Marrero; and the back play area at Saint Joseph's Church, a former Catholic parochial school in Gretna. START conducted written and photographic documentation at each location. LDEQ Sharp collected bulk samples at each location for analysis of asbestos by PLM at the LDEQ asbestos lab in Baton Rouge. The LDEQ analytical results confirmed the presence of chrysotile and crocidolite asbestos fibers in the samples collected by LDEQ representative Sharp. Details of the LDEQ sample results will be presented in the final report to be submitted to the EPA at a later date.

On May 2, 1996, START Naquin meet with EPA TM and EPA Chris Petersen at the WBA site to tour the ACM locations. START Naquin submitted the first Removal Assessment Interim Report to EPA TM Martin at the time. START and EPA visited the residential location at (b) (6) in Marrero, where the resident had removed the ACM from the driveway. START and EPA also drove by the Gretna No. 2 Kindergarten Center in Gretna and several other representative ACM locations. After the site visit, START and EPA attended a meeting with the LDEQ in Baton Rouge to discuss the results of the sampling mission and any possible future actions at the WBA site. Attendees at the meeting included: EPA representatives Petersen and Martin; START Naquin; and LDEQ representatives Bendily, Coltrin, Levy, John Newton, Bob Hannah, Betty Brousseair, and Glenn Miller. It was agreed that a meeting with the local authorities in Jefferson and Orleans Parish, as well as state representatives, would need to be held to inform them of the site activities to date and discuss possible future actions. The meeting was tentaviley scheduled for May 28, 1996.

On May 13, 1996, START Naquin attended a LDEQ meeting to discuss the upcoming public meeting with the local officials from Jefferson and Orleans parishes and to present a slide show to illustrate current site conditions. Attendees at the meeting included: START Naquin; LDEQ representatives Bendily, Coltrin, Sharp, Newton, Gus Von Bodungen, Tammy Guillotte, and Ronnie Wascom; and LDHH representatives Ken Lanier and Robert Starszak. The LDEQ discussed issues such as the draft letter they were preparing to invite the officials to the meeting

and a fact sheet on asbestos to inform the general public. The LDHH decided they would conduct an epidemiological study of the westbank area for asbestos related diseases such as lung cancer, mesothelioma, and asbestosis. The meeting with the state and local officials was tentatively rescheduled for June 6, 1996, pending confirmation from the EPA. The meeting was later postponed indefinitely until a course of action could be determined for the site by the EPA.

On May 30, 1996, START Naquin was accompanied by LDEQ representatives Bendily and Guillotte to the WBA site to complete mapping of the ACM locations and to conduct further reconnaissance of the Algiers area. START Naquin mapped in the final nine ACM locations and identified three additional ACM locations in the Algiers area. The calculations of waste volume estimates was revised to add in newly discovered ACM locations and removed the black, asphalt-like material. The revised waste volume calculations are present in Attachment C.

Removal assessment activities conducted at the WBA site have initially identified 613 locations of ACM including three schools and three day care centers. Soil and bulk samples were collected to characterized the presence of asbestos fibers at the suspect ACM locations. The bulk samples consisted of the two suspect materials which included a black, asphalt-like material and light bluish-grey, cementitious material. The analytical results revealed the presence of asbestos fibers in all of the soil samples and in the light bluish-grey, cementitious material; however, no asbestos fibers were detected in the black, asphalt-like material. The black, asphalt-like material was identified to be present at 32 locations, eight other locations have a combination of the asphalt-like material and the light bluish-grey, cementitious material. As of June 14,1996, a total of 581 locations of ACM have been posivitively identified at the WBA site. A disk copy of the Removal Assessment-Interim Report No. 2, Phase I Work Plan, and Sampling QA/QC Plan is presented in Attachment E.

ATTACHMENTS:

A. Site Location Map, Revised June 14, 1996
B. ACM Location Maps (14 pages)
C. Calculations of Waste Volume Estimates, Revised June 14, 1996
D. Data Base of Property Owners (15 pages)
E. Disk Copy of Removal Assessment Interim Report No. 2, Phase I Work Plan, and Sampling QA\QC Plan (in WP 6.1)
F. Copy of the Phase I Work Plan (20 pages)
G. Copy of the Sampling QA/QC Plan (82 pages)

ATTACHMENT C
ANALYTICAL DATA OF SOIL SAMPLES
(7 PAGES)

NVLAP

·TEM/SEM/XRD
·PCM/PLM
ENVIRONMENTAL SITE ASSESSMENTS
WETLANDS DELINEATION

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

1147 BRITTMOORE RD., SUITE 112 HOUSTON, TEXAS 77043 (713) 932-0015 FAX: 713/984-0963

April 27, 1996

Mr. Troy Naquin
Ecology & Environment
11550 Newcastle Avenue, Suite 250
Baton Rouge, LA 70816

RE: Our Job No. RESH 9069, Your Job "Westbank Asbestos/003501SFG1" - Results of Transmission Electron Microscopy (TEM)/Energy Dispersive X-ray Spectrometry (EDX)/Selected Area Electron Diffraction (SAED) Analysis of the following Bulk Material Samples for Asbestos Structure Semi-quantitative Concentrations: WAS-041601, 041602, 041603, 041604, 041605, 041606, 041607, WAB-041734T, WAS-041708, 041709, 041710, 041711, 041712, 041713, 041714, 041715, 041716, 041717, 041718, 041819, 041820, 041821, 041822, 041824, 041825, 041826, 041827, 041828, 041829, 041830, 041714QC, 041830QC

Dear Mr. Naquin:

Reservoirs Environmental Services, Inc. (RESI) has analyzed thirty-two bulk material samples for asbestos structure semi-quantitative concentration as per your request. The samples were received on April 19, 1996, and analytical results were forwarded to you within 5 days. The objective of the analyses was to determine if asbestos was present in the bulk material samples, and if present, report asbestos structure semi-quantitative concentrations (weight percent). The samples data for these analyses can be found in Table I. The analyses was carried out based on a method outlined by Chatfield 1988 "Analysis of Vinyl Floor Tile".

Summary of Analytical Results

Thirty-two bulk samples (soil) were submitted for TEM Chatfield analysis. All thirty-two samples were thoroughly examined and twenty-nine of the samples had asbestos detected and confirmed. Samples WAS-041828, WAS-041829, WAS-041830 and WAS-041830QC had no asbestos detected.

Analytical Procedure

A representative subsample of the bulk material (most commonly floor tile) is weighed and then placed in a muffle furnace to burn away all organic material. The sample is ground in a mortar and pestle and treated with acid to dissolve any carbonate material. The particulate material that remains after the acid treatment is suspended in water, deposited on a pre-weighed polycarbonate filter and weighed. A sample of this residue is examined in the TEM to identify the particulate debris. An estimate of the amount of asbestos present in the particulate is related to the origianl weight sample, as well as estimated percentages of organic and carbonate matrix materials. A calculated semi-quantitative weight percent is the result of the analysis.

Reservoirs Environmental Services, Inc. has assigned job number RESH 9069 to this study. This report is considered highly confidential and the sole property of Ecology & Environment. RESI will not discuss any part of this study with parties other than the client without express authorization. Two (2) copies of this report have been delivered to Mr. Naquin of Ecology & Environment and one (1) copy has been retained in confidential files by RESI for future reference with Ecology & Environment. In addition, all data sheets original electron micrographs and supporting data obtained during the analysis will be retained in confidential files by RESI.

If you should have any questions about this report, please feel free to call me at Reservoirs Environmental Services, Inc., Houston, Texas at (713) 932-0015.

Sincerely,

Richard K. Harding
Manager-Houston Division

RKH:mt

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP ACCREDITED LABORATORY 101896-1

TABLE I. BULK SAMPLE DATA

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
Client Project: WESTBANK ASBESTOS/003501SFG1
Date Samples Received: 19-Apr-96
Analysis Type: CHATFIELD
Turnaround: 5 DAY

Client ID Number	Lab ID Number	Material Type	Asbestos Mineral Present	Asbestos Concentration (% By Weight)
WAS-041601	67028	SOIL	CHRYSOTILE/AMPHIBOLE	25 TO 30
WAS-041602	67029	SOIL	CHRYSOTILE/AMPHIBOLE	20 TO 25
WAS-041603	67030	SOIL	CHRYSOTILE/AMPHIBOLE	20 TO 25
WAS-041604	67031	SOIL	CHRYSOTILE/AMPHIBOLE	25 TO 30
WAS-041605	67045	SOIL	CHRYSOTILE/AMPHIBOLE	25 TO 30
WAS-041606	67046	SOIL	CHRYSOTILE/AMPHIBOLE	25 TO 30
WAS-041607	67047	SOIL	CHRYSOTILE/AMPHIBOLE	15 TO 20
WAB-041734T	67051	SOIL	CHRYSOTILE/AMPHIBOLE	35 TO 40
WAS-041708	67054	SOIL	CHRYSOTILE/AMPHIBOLE	35 TO 40
WAS-041709	67055	SOIL	CHRYSOTILE	5 TO 10
WAS-041710	67056	SOIL	CHRYSOTILE	1 TO 5
WAS-041711	67058	SOIL	CHRYSOTILE/AMPHIBOLE	5 TO 10
WAS-041712	67059	SOIL	CHRYSOTILE/AMPHIBOLE	15 TO 20
WAS-041713	67069	SOIL	CHRYSOTILE/AMPHIBOLE	40 TO 45
WAS-041714	67070	SOIL	CHRYSOTILE/AMPHIBOLE	15 TO 20

NA = Not Analyzed

ND = None Detected

* = In accordance with the above referenced analytical protocol, "If the TEM examination shows that the final residue contains no chrysotile asbestos, or it incorporates only a few short chrysotile fibers consistent with a background measurement, the result shall be reported as "None Detected"".

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

NVLAP ACCREDITED LABORATORY 101896-1

TABLE I. BULK SAMPLE DATA

RES Job Number: 9069
Client: ECOLOGY & ENVIRONMENT
Client Project: WESTBANK ASBESTOS/003501SFG1
Date Samples Received: 19-Apr-96
Analysis Type: CHATFIELD
Turnaround: 5 DAY

Client ID Number	Lab ID Number	Material Type	Asbestos Mineral Present	Asbestos Concentration (% By Weight)
WAS-041715	67071	SOIL	CHRYSOTILE/AMPHIBOLE	30 TO 35
WAS-041716	67072	SOIL	CHRYSOTILE	25 TO 30
WAS-041717	67073	SOIL	CHRYSOTILE/AMPHIBOLE	20 TO 25
WAS-041718	67074	SOIL	CHRYSOTILE/AMPHIBOLE	15 TO 20
WAS-041819	67079	SOIL	CHRYSOTILE/AMPHIBOLE	15 TO 20
WAS-041820	67080	SOIL	CHRYSOTILE/AMPHIBOLE	30 TO 35
WAS-041821	67081	SOIL	CHRYSOTILE/AMPHIBOLE	35 TO 40
WAS-041822	67082	SOIL	CHRYSOTILE/AMPHIBOLE	45 TO 50
WAS-041824	67092	SOIL	CHRYSOTILE/AMPHIBOLE	25 TO 30
WAS-041825	67093	SOIL	CHRYSOTILE/AMPHIBOLE	25 TO 30
WAS-041826	67094	SOIL	CHRYSOTILE/AMPHIBOLE	35 TO 40
WAS-041827	67095	SOIL	CHRYSOTILE/AMPHIBOLE	45 TO 50
WAS-041828	67098	SOIL	ND	ND
WAS-041829	67099	SOIL	ND	ND
WAS-041830	67100	SOIL	ND	ND
WAS-041714QC	67070	SOIL	CHRYSOTILE/AMPHIBOLE	10 TO 15
WAS-041830QC	67100	SOIL	ND	ND

NA = Not Analyzed

ND = None Detected

* = In accordance with the above referenced analytical protocol, "If the TEM examination shows that the final residue contains no chrysotile asbestos, or it incorporates only a few short chrysotile fibers consistent with a background measurement, the result shall be reported as "None Detected"".

Attachment I

Key to Count Sheets

Structure identifications consist of an *Asbestos Type* followed by a *Structure Type.*

Asbestos Types
A = amosite
An = anthophyllite
C = chrysotile
Cr = crocidolite
T = tremolite

Structure Types
F = fiber
B = bundle
C = cluster
M = matrix

NSD = no structures detected
/M = other structure associated with a matrix
NA = non-asbestos fiber
/X = partly obscured by grid bar
QF = questionable fiber, no confirmation of identification

Sizing Conversion

1 length unit = 5 mm on screen = 0.335 micron
1.49 length units = .5 micron
14.9 length units = 5 microns
1 width unit = 1 mm on screen = 0.067 micron

TEM Analysts

Michael D. Allen
Jeanne S. Orr
Virginia Fonte
Paul D. Lo Scalzo
Richard K. Harding
Patrick Coughlan
Cheryl Dempsey
Carlos D. Salinas

Job Number: RES 9069

Filter Type: —

Operator: RKH

Client Sample No: WAS-041601,02,03,04,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,24,25,26,27 WAS-041734T

Filter Area: — mm^2

Mag/Volts: 20KX/100KV

Lab Sample No: See Below

Grid Opening Area: 0.0092 mm^2

Date: 4/25/96

Instrument: JEOL 100C

No.GO's Analyzed: Chatfield

Page: 1 of 2

Grid Opening	Structure Type	Length	Width	Confirmation SAED	Confirmation EDX	Photo ID#	Comments
67028	Chrysotile + Amphibole Asbestos Detected						~25-35%
67029	Chrysotile + Amphibole Asbestos Detected						~20-30%
67030	Chrysotile + Amphibole Asbestos Detected						~20-25%
67031	Chrysotile + Amphibole Asbestos Detected						~30-35%
67045	Chrysotile + Amphibole Asbestos Detected						~35-40%
67046	Chrysotile + Amphibole Asbestos Detected						~30-35%
67047	Chrysotile + Amphibole Asbestos Detected						~20-25%
67051	Chrysotile + Amphibole Asbestos Detected						~40-50%
67054	Chrysotile + Amphibole Asbestos Detected						~40-50%
67055	Chrysotile Asbestos Detected						~5-10%
67056	Chrysotile Asbestos Detected						~1-5%
67058	Chrysotile + Amphibole Asbestos Detected						~5-10%
67059	Chrysotile + Amphibole Asbestos Detected						~15-20%
67069	Chrysotile + Amphibole Asbestos Detected						~40-50%
67070	Chrysotile + Amphibole Asbestos Detected						~15-20%
67071	Chrysotile + Amphibole Asbestos Detected						~30-40%
67072	Chrysotile Asbestos Detected						~30-40%
67073	Chrysotile + Amphibole Asbestos Detected						~25-35%
67074	Chrysotile + Amphibole Asbestos Detected						~20-25%
67079	Chrysotile + Amphibole Asbestos Detected						~15-20%
67080	Chrysotile + Amphibole Asbestos Detected						~40-58%
67081	Chrysotile + Amphibole Asbestos Detected						~40-50%
67082	Chrysotile + Amphibole Asbestos Detected						~35-45%
67082	Chrysotile + Amphibole Asbestos Detected						~65-75%
67093	Chrysotile + Amphibole Asbestos Detected						~35-45%
67094	Chrysotile + Amphibole Asbestos Detected						~45-55%
67095	Chrysotile + Amphibole Asbestos Detected						~65-75%

Job Number: RES 9069 Filter Type: —— Operator: RKH

Client Sample No: WAS-041838,29,30 WAS-041714QC WAS-041830QC Filter Area: —— mm² Mag/Volts: 20KX/100KV

Lab Sample No: See Below Grid Opening Area: 0.0092 mm² Date: 4/25/96

Instrument: JEOL100C No.GO's Analyzed: Chatfield Page: 2 of 2

Grid Opening	Structure Type	Length	Width	Confirmation SAED	Confirmation EDX	Photo ID#	Comments
67098	No Asbestos Detected						
67099	No Asbestos Detected						
67100	No Asbestos Detected						
67070 QC	Chrysotile + Amphibole Asbestos Detected ~15-20%						
67100 QC	No Asbestos Detected						

A24 C-7

ATTACHMENT D
COPY OF CHAIN OF CUSTODY RECORDS
(7 PAGES)

ENVIRONMENTAL PROTECTION AGENCY
Region 6

OFFICIAL CHAIN OF CUSTODY RECORD

PROJ. NO. 00350116 | PROJECT NAME: Westbank Asbestos

SAMPLERS: (Signature) Thomas M. Naquin

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS 4oz	EPA 600/R-93/116	COC Seq. #
WAB-041501	04/15/96	1354		✓	(b) (6)	1	✓	6-062601
WAB-041502	04/15/96	1403		✓		1	✓	6-062602
WAB-041503	04/15/96	1440		✓		1	✓	6-062603
WAB-041504	04/15/96	1513		✓		1	✓	6-062604
WAB-041505	04/15/96	1523		✓		1	✓	6-062605
WAB-041506	04/15/96	1609		✓		1	✓	6-062606
WAB-041507	04/15/96	1633		✓		1	✓	6-062607
WAB-041508	04/15/96	1700		✓		1	✓	6-062608
WAB-041509	4/16/96	0815		✓		1	✓	6-062609
WAB-041510	4/16/96	0831		✓		1	✓	6-062610
WAB-041511	4/16/96	0840		✓		1	✓	6-062611
WAB-041512	4/16/96	0855		✓		1	✓	6-062612
WAB-041513	4/16/96	0902		✓		1	✓	6-062613
WAB-041514	4/16/96	0918		✓		1	✓	6-062614
WAB-041515	4/16/96	0940		✓		1	✓	6-062615

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time
Thomas M. Naquin	4/19/96 1109			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks

Shipped by: | Airbill Number:

Distribution: White Accompanies Shipment; Pink to Coordinator Field File
Green to Report; Yellow Returns with Warrant

000348

Region 6

OFFICIAL CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
06-3501-57-61	Westbank Asbestos

SAMPLERS: *(Signature)* [signature] [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	EPA 600/R 93/116	EPA 600/R-93/116 (Chatfield Method)					Cont Tag
WAB-041616	4/16/96	1035		✓	(b)(6)	1	✓						6-06261?
WAB-041617	4/16/96	1105		✓		1	✓						6-06261?
WAB-041618	4/16/96	1130		✓		1	✓						6-06261?
WA-041601	4/16/96	1142	✓			1		✓					6-062619
WAB-041602	4/16/96	1155	✓			1		✓					6-06262?
[illegible]	4/16/96	11??	✓			1		✓					6-06262?
WAB-041604	4/16/96	11??	✓			1		✓					6-06262?
WAB-041619	4/16/96	1333	[illegible]	✓		1	✓						6-06262?
WAB-041620	4/16/96	1342		✓		1	✓						6-06262?
WAB-041621	4/16/96	1358		✓		1	✓						6-06262?
WAB-041622	4/16/96	14??		✓		1	✓						6-06262?
WAB-041623	4/16/96	1430		✓		1	✓						6-06262?
WAB-041624	4/16/96	1500		✓		1	✓						6-06262?
WAB-041625	4/16/96	1540		✓		1	✓						6-06262?
WAB-041626	4/16/96	1605		✓		1	✓						6-0626??

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time
[signature]	4/17/96 1109			
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
Shipped by:		Airbill Number:		

Distribution: White Accompanies Shipment; Pink to Coordinator Field Files; Green to Report; Yellow Returns with Warrant

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000349

ENVIRONMENTAL PROTECTION AGENCY
Region 6

OFFICIAL
CHAIN OF CUSTODY RECORD

REGION 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

PROJ. NO.	PROJECT NAME
06-[illegible]	Westbank Asbestos

SAMPLERS: *(Signature)* [signature] [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS	EPA 600/R 93/116	EPA 600/R 93/116 [illegible] method					REMARKS See Tag #
WAB-[illegible]	[illegible]	1027		✓	(b)(6)	1	✓						6-062631
WAB 04[illegible]	[illegible]	1045		✓		1	✓						6-062632
WAB [illegible]	[illegible]	1710		✓		1	✓						6-062633
WAB-[illegible]	[illegible]/96	1[illegible]5	✓			1	✓						6-062634
WAB-[illegible]	4/16/96	173[illegible]	✓			1	✓						6-062635
WAB-[illegible]	[illegible]/96	1752	✓			1		✓					6-062636
[illegible]	[illegible]	[illegible]	✓			1		✓					6-062637
[illegible]	[illegible]	12[illegible]	✓			1		✓					6-062638
WAB-04[illegible]	4/17/96	0813		✓		1	✓						6-062639
WAB04[illegible]33	4/17/96	0842		✓			✓						6-062640
WAB04[illegible]34	4/17/96	0745		✓			✓						6-062641
WAB-04[illegible]34T	4/17/96	0745		✓				✓					6-062642
WAB-04[illegible]35	[illegible]/96	1022		✓			✓						6-062643
WAB-04[illegible]36	[illegible]/96	10[illegible]		✓			✓						6-062644

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
[signature]	4/19/96 1109				

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks

Shipped by:

Airbill Number:

Distribution: White Accompanies Shipment; Pink to Coordinator Field Files; Green to Report; Yellow Returns with Warrant

D-3

000350

A28

6- 3064

ENVIRONMENTAL PROTECTION AGENCY
Region 6

OFFICIAL CHAIN OF CUS DY RECORD

REGION 6
1445 Ross Ave e, Suite 1200
Dallas, Tex. 202-2733

PROJ. NO.	PROJECT NAME
703501SF61	Westbank Asbestos

SAMPLERS: *(Signature)* [signatures]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS 4oz	EPA 600/R-93/116	EPA 600/R-93/116 [illegible] method				REMARKS COC Tag #
WAS-041706	4/11/96	1100	✓		(b) (6)	1		✓				6-062645
WAS-041709	4/11/96	1103	✓			1		✓				6-062646
WAS-041710	4/11/96	1111	✓			1		✓				6-062647
WAB-041737	4/11/96	1245		✓		1	✓					6-062648
WAS-041711	4/11/96	1259	✓					✓				~~6-062650~~ 6-062649
WAS-041712	4/11/96	1303	✓					✓				6-062650
WAB-041738	4/11/96	1327		✓	(b)(6)		✓					6-062701
WAB-041739	4/11/96	1410		✓			✓					6-062702
WAB-041740	4/11/96	1442		✓			✓					6-062703
WAB-041741	4/11/96	1515		✓			✓					6-062704 ([illegible])
WAB-041742	4/11/96	1535		✓			✓					6-062705
WAB-041743	4/11/96	1600		✓			✓					6-062706
WAB-041744	4/11/96	1621		✓			✓					6-062707
WAB-041745	4/11/96	1640					✓					6-062708

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
[signature]	4/19/96 1105				
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks

Shipped by: | Airbill Number:

Distribution: White Accompanies Shipment; Pink to Co dinator Field Files;
Green to Report; Yellow Returns with War nt

D-4

000351

6- 3065

ENVIRONMENTAL PROTECTION AGENCY
Region 6

OFFICIAL CHAIN OF CUSTODY RECORD

REGION 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

PROJ. NO.	PROJECT NAME
002.C1131761	Westbank Asbestos

SAMPLERS: *(Signature)* [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	EPA 600/R-93/116	EPA 600/R-93/116 Chatfield method					REMARKS (Lab #)
WAB-041706	4/17/96	1730		✓	Vacant lot on Avenue 6 - Westwego	1	✓						6-062709
WAS-041712	4/17/96	1739	✓		Vacant lot on Avenue 6 - Westwego 6 inches into drainage pathway	1		✓					6-062710
WAS-041714	4/17/96	1742	✓		Vacant lot on Avenue 6 - Westwego 12 inches into drainage pathway	1		✓					6-062711
WAS-041715	4/17/96	1745	✓		Vacant lot on Avenue 6 - Westwego 24 inches into drainage pathway	1		✓					6-062712
WAS-041716	4/17/96	1748	✓		Vacant lot on Avenue 6 Westwego 36 inches into drainage pathway	1		✓					6-062713
WAS-041717	4/17/96	1751	✓		Vacant lot on Avenue 6 Westwego 54 inches into drainage pathway	1		✓					6-062714
WAS-041710	4/17/96	1754	✓		Vacant lot on Avenue 6 Westwego 18 inches into drainage pathway	1		✓					6-062715
WAB-041717	4/17/96	1843		✓	(b)(6)	1	✓						6-062716
WAB-041718	4/17/96	1847			(b)(6)	1	✓						6-062717
WAB-041719	4/17/96	1907			Material on top of sidewalk in the ... and windows on Bayou ...	1	✓						6-062718
~~WAB-041011~~ TMP 7-17-96													

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
[signature]	4/19/96 1109				
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks

Shipped by:
Airbill Number:

Distribution: White Accompanies Shipment; Pink to Coordinator Field Files;
Green to Report; Yellow Returns with Warrant

6- 3066

000352

ENVIRONMENTAL PROTECTION AGENCY
Region 6

OFFICIAL
CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
00350151G4	Westbank Asbestos

SAMPLERS: *(Signature)* Troy n. Naquin [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS 402	EPA 600/R-93/116	EPA 600/R-93/116 Chatfield Method					COC Ta
WAB-041850	4/16/96	1000		✓	(b)(6)	1	✓						6-062719
WAS-041819	4/15/96	1010	✓			1		✓					6-062720
WAS-041820	4/16/96	1013	✓			1		✓					6-062721
WAS-041821	4/18/96	1015	✓			1		✓					6-062722
WAS-041822	4/19/96	1019	✓			1		✓					6-062723
WAB-041851	4/17/96	1025		✓		1	✓						6-062724
WAB-041852	4/13/96	1055		✓		1	✓						6-062725
WAB-041853	4/18/96	1120		✓		1	✓						6-062726
WAB-041854	4/10/96	1248		✓		1	✓						6-062727
WAB 041855	4/12/96	1301		✓		1	✓						6-062728
WAB-041856	4/12/96	1332		✓		1	✓						6-062729
WAB-041857	4/13/96	1355		✓		1	✓						6-06273
WAB-041858	4/10/96	1414		✓		1	✓						6-062731

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time
Troy n. Naquin [signature]	4-19-96 ~~HC~~ TMV 4/19/96 1105			
Relinquished by: *(Signature)*	**Date / Time**	**Received by:** *(Signature)*	**Relinquished by:** *(Signature)*	**Date / Time**
Relinquished by: *(Signature)*	**Date / Time**	**Received for Laboratory by:** *(Signature)*	**Date / Time**	**Remarks**

Shipped by: | Airbill Number:

Distribution: White Accompanies Shipment; Pink to Coordinator Field Files; Green to Report; Yellow Returns with Warrant

0-6

000353

ENVIRONMENTAL PROTECTION AGENCY
Region 6

OFFICIAL CHAIN OF CUSTODY RECORD

REGION 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

PROJ. NO.	PROJECT NAME
003501SFG1	Westbank Asbestos

SAMPLERS: (Signature) Anna M. Nagumi

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS 4oz	EPA 600/R-93/116	EPA 600/R-93/116 / Asbestos field method	REMARKS
WAS-041825	4/12/96	1121		✓	(b)(6)	1		✓	6-062732 - Note: extra sample glass dissipated
WAS-041824	4/12/96	1423	✓			1		✓	6-062733
WAS-041826	4/12/96	1426	✓			1		✓	6-062734
WAS-041826	4/12/96	1433	✓			1		✓	6-062735
WAS-041827	4/12/96	1430	✓			1		✓	6-062736
WAS-041853	4/12/96	1444		✓	(b)(6)	1	✓		[illegible] 6-062737
WAS-041840	4/12/96	1502		✓		1	✓		6-062738
WAS-041820	4/12/96	1606	✓			1		✓	6-062739
WAS-041829	4/12/96	1625	✓			1		✓	6-062740
WAS-041830	4/12/96	1633	✓			1		✓	6-062741

#32

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Anna M. Nagumi	4/17/96 1105				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
Shipped by:		Airbill Number:			

Distribution: White Accompanies Shipment; Pink to Coordinator Field Files;
Green to Report; Yellow Returns with Warrant

000354

6-3068

ATTACHMENT E
REMOVAL COST ESTIMATES
(2 PAGES)